

### **ABSTRACT**

A method for forming a bottom spin-valve GMR sensor having ultra-thin layers of high density and smoothness and possessing oxygen surfactant layers as a result of the layers being sputtered in a mixture of Ar and O<sub>2</sub>. A particularly novel feature of the method is the use of a sputtering chamber with an ultra-low base pressure and correspondingly ultra-low pressure mixtures of Ar and O<sub>2</sub> sputtering gas (<0.5 millitorr) in which the admixed oxygen has a partial pressure of less than  $5 \times 10^{-9}$  torr.